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Introduction

This document is the latest Arkansas Fire Weather Operating Plan. It serves to consolidate the fire weather services provided by National Weather Service (NWS) offices covering the state. The purpose of this operating plan can be broken down into three distinct areas. The first is to consolidate all the fire weather services provided by the five NWS offices covering the state of Arkansas. The NWS has recently completed its Modernization and Associated Restructuring (MAR) in which the fire weather zones for the state of Arkansas were split among five NWS offices. The second purpose is to describe the services available to the land management agencies. The final purpose is to provide information and guidelines to the forecasting staff at the five NWS offices to ensure that consistent information is given to its customers. Customers of NWS fire weather products and services in Arkansas must understand that the products and policies contained within may differ slightly based on local policy and procedure. The entire document may not completely apply to them.

Due to the continuing changes in the NWS, this operating plan will be a constant “work in progress” and will be updated as necessary. In the event this is necessary, affected agencies will be notified and addendums to this plan will be issued. Important changes and clarifications of the fire weather services will be listed in the introductory section in the next update.

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Input and information was received from other NWS fire program leaders who have fire weather responsibility in Arkansas. These people are

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Important Changes

The National Weather Service has standardized the Fire Weather Forecasts issued by individual offices in a tabular format. Offices have the option of using a standardized narrative format. The standard format used by an office depends on customer requirements but currently all offices serving the State of Arkansas use the tabular format. A detailed explanation of the new product, including required and optional elements, is included in the **Forecast Products** Section.

The other significant change is the use of a national standard to request spot forecasts for wildfires. This standard for spot forecasts is now Internet based and ensures that fire suppression personnel brought in from another area of the country will be proficient in the interpretation of any spot forecast issued for wildfires. A detailed explanation of the new spot forecast program including required and optional elements is included in the **Forecast Products** Section.

General Information

What is a wildfire?

A wildfire is an undesirable fire occurring in the natural environment. Each year more than 100,000 wild land fires occur in the United States.

How do wildfires start?

About 90% of wildfires are started by humans; the other 10% are started by lightning. Three components are necessary to start a fire: oxygen, fuel and heat. At least 16 percent oxygen must be in the air for a fire to start (our atmosphere contains 21%). Fuel is any living or dead material that will burn. Fuels such as dead plants, dry leaves, pine needles and grass will burn more readily than moist green plants because the dead material contains less moisture. Heat is usually supplied by a lightning strike to a tree or dry grass. People also can provide heat by carelessly starting a fire or leaving a fire unattended.

When is fire season?

The fire season in Arkansas is complex, and to a large extent dependent upon dormant fuels and drought. While the majority of wildfires occur from October to April, wildfires are possible at any time of the year. As such, the user defined fire weather season in Arkansas is for the entire year. In reality, fire season extends from October 1st to November 30th and again from February 1st to April 30th. These time frames correspond with the majority of the prescribed burning. **Note:** Starting in October 2004, the official fire weather season will run continuously from October 1st to April 30th for a total season of 212 days.

What is the role of the National Weather Service in fighting wildfires?

The objective of the National Weather Service Fire Weather Program is to provide meteorological support to wild land fire management agencies for the protection of life and property. This support includes warnings, forecasts, on-site services during wildfires, and meteorological training for fire fighters. The mission of operational excellence through superior future services, scientific advancements, and new technologies is being supported by the Boise Risk Reduction. The National Weather Service Forecast Office in Boise, Idaho is located at the National Interagency Fire Center. This office is the focus of a risk reduction project which is seeking to improve and modernize fire weather forecasting services in conjunction with the NWS Modernization and Restructuring.

Weather is one of the most significant factors in determining the severity of wild land fires. The spread rate and intensity of fires are directly related to the wind speed, temperature and relative humidity. Climatic conditions such as long term drought also play a major role in the number and intensity of wildfires. Accurate and timely weather information is vital to the planning and execution of strategies for suppressing wildfires. An accurate weather forecast can mean life or death to a fire fighter and is also critical in protecting forest and range lands as well as the increasing number of homes in the wild land urban interface.

The National Weather Service Mission

It is well known the primary mission of the NWS is to protect life and property from hazardous weather. This is normally accomplished through the issuance and dissemination of watches, warnings, advisories and forecasts with the general public being the primary beneficiary of the information. However, through an agreement between the NWS and wild land fire agencies, this primary mission has been expanded to support specific land management, fire protection and fire suppression activities.

The National Weather Service Objective

The objective of the National Weather Service Fire Weather Services Program is to provide fire weather products and services to the fire and land management community for the protection of life and property, promotion of firefighter safety, and stewardship of America's public wildlands.

The National Weather Service Mission and fire weather

To accomplish the fire weather aspect of the NWS mission, each NWS office is staffed around the clock with meteorologists who are trained in fire weather. Each office provides a level of fire weather support determined by the local NWS office and fire agencies. In addition to general training, each office has designated a certain individual or several individuals with special skills, knowledge and training to serve as the Fire Weather Program Leaders (FWPL). These meteorologists are the main liaison between the NWS office and fire agencies. The FWPL will also coordinate the administrative activities and be the primary contact point in the office to maintain the successful working relationship with the fire weather customers. The routine fire weather support is provided by the general forecast staff with program oversight and coordination provided by the FWPL.

The fire weather program leader is the customer's representative and the liaison between user agencies and the National Weather Service Meteorologist in Charge at said office. The fire weather program leader will provide additional services at the request of the user agencies. These additional services may involve visits for familiarization of operations, training of observers, and instruction of S-290, and S-390 courses.

In addition to the FWPL, certified Incident Meteorologists (IMETs) are strategically positioned at NWS offices across the country. These meteorologists are specifically trained to aid in wildfire suppression in the field. Requests for IMET deployment to a wildfire are coordinated by the staff meteorologist at the National Interagency Fire Center (NIFC) which is located in Boise, Idaho.

Questions, comments, topics for discussion or queries regarding any aspect of fire weather or the fire weather program should be addressed to the appropriate NWS office, or that office's Meteorologist in Charge (MIC). The MIC's for individual offices are listed in the section entitled "NWS Offices and Responsibility" starting on page 24.

Red Flag Program

The intent of the red flag program is to provide land management agencies with appropriate notification of the likelihood those weather conditions associated with the outbreak of wildfire will occur. A red flag event is defined as a combination of critical fire weather patterns and critically dry fuels that could lead to the development of large wild land fires or cause containment problems for preexisting fires or prescribed burns. Forecasters will issue a fire weather watch or red flag warning, based on the criteria and timing explained below, under the product identifier RFW.

1. Criteria. The criteria for fire weather watches and red flag warnings has been established by the NWS in conjunction with various state and federal land agencies. For a red flag event, all three of the following criteria must be met.

1. Afternoon minimum relative humidity expected to be 25% or lower.
2. 20 foot sustained winds of 14 mph or greater. Remember we are not dealing with the higher and most likely stronger 10 meter ASOS winds. We are instead concerned with the 20 foot surface winds over the mean vegetation which may be as little as ½ of what airport winds are running
3. Fuels that are determined to be critically dry. This is usually determined via coordination with the USDA Forest Service dispatch center (phone #501-321-5232). If contact cannot be established, then the forecaster should access the 10-hour dead fuel moisture map which is available of the Internet. Values less than 10 percent are considered critical for 10 hour fuels. Other parameters that also should be considered include the likelihood of lightning occurrence, wind shifts, and/or current wildfire activity.

Basic versus special services

It is crucial to point out the differences in basic services and special services as defined by the National agreement.

Basic Services -

Basic services are meteorological services performed from the NWS office. Basic services are usually performed during normal hours of operations and are provided to user agencies at no cost. The Arkansas Forestry Commission, the USDA Forest Service, the National Park Service, and the U.S. Fish and Wildlife Service have land management responsibilities. The NWS is responsible for providing accurate and timely fire weather forecasts to effectively carry out their responsibilities for the protection of life and property.

Special Services -

Special services are meteorological services provided to user agencies who often have unique requirements for weather support. These services may best be performed by the fire weather program leader or IMET at a site other than the forecast office. Special services are usually initiated by the requesting agency, and costs such as travel and per diem will be reimbursable to the NWS.

Special meteorological services are those requiring a meteorologist to be away from the Forecast Office, and/or, in non-emergency situations, to be on overtime. Special services include Advanced Technology Meteorological Unit (ATMU) staffing and other on-site meteorological services such as weather observer training, weather station visits, and training requested by other user agencies. User agencies such as the USDA or the National Park Service are responsible for paying overtime, travel, and per diem costs for special services. Costs to be recovered from the user are calculated on the basis of expense reports submitted by the Forecast Office to NWS Southern Region Headquarters. Billing of the user agencies is handled by the appropriate NWS administrative division based on the expense report. Bills include a statement of services rendered, as well as the dates and locations of services provided.

Advanced Technology Meteorological Unit (ATMU) Services-

The ATMU consists of two (2) modules. The first module contains a theodolite with a tripod and a calculator for calculating winds aloft, two belt weather kits, weather balloons, a nozzle and regulator for a helium tank, office supplies and miscellaneous expendables. It is 27.6 cubic feet and weighs 201 pounds. The second module, known as the computer module, contains a laptop computer with a satellite docking station and a satellite dish for down linking weather data and a printer. It is five cubic feet and weighs 55 pounds. A third module, the microREMS, is a self-contained portable weather station with instruments for measuring temperature, dew point and wind. It is powered by a solar panel and battery. It is 8.2 cubic feet and weighs 125 pounds.

Requests for the ATMU, microREMS, and IMET should be made through the USDA Forest Service Forest Service Region 8 dispatch office in Atlanta. The fire weather program leader or Meteorologist-in-Charge at the appropriate NWS office should be made aware of the need for ATMU and IMET services in their County Warning and Forecast Area (CWFA). Typically, the IMET nearest the incident will be deployed. **Note:** Not all NWS offices have a certified IMET. USDA Forest Service Regions should have a list of available IMETs. During times of limited resources, IMETs from other areas of the country may be called.

The requesting agency is responsible for coordinating transportation of the ATMU and the IMET to and from the incident. The requesting agency is also responsible for any storage of the unit while in transit, and shelter for the IMET and unit at the site. A sheltered work area, of at least 50 square feet with a table and chair, must be protected from excessive dust, be free of standing water or condensation, and must be heated and/or cooled sufficiently to allow efficient operation of equipment. Power (120V AC) must be provided for the ATMUs electrical equipment and priority telephone access during certain short periods each day must be made available.

The first notification of the mobilization of the fire weather meteorologist will normally be by phone from the National Weather Service Southern Region fire weather program leader. The following information should be obtained from the program manager if available at that time

1. Location and name of fire or incident
2. Fire resource number
3. Travel arrangements

After notification, immediate steps should be taken to cover all the shifts that the fire weather meteorologist would otherwise be working in his home office. The laptop computer, portable printer and modem will be carried by the fire weather meteorologist to the fire or incident.

Fire Weather Training -

National Weather Service fire weather meteorologists are available to assist fire control agencies with training at fire behavior school and other related courses. Requests for assistance should be forwarded to the Meteorologist-in-Charge (MIC) at the respective NWS office(s) by written letter.

Communications

Any weather forecast product produced by the NWS is transmitted through the Advanced Weather Interactive Processing System (AWIPS). The products are then routed in the U.S. Forest Service's Weather Information Management System or WIMS. The NWS carries the responsibility of ensuring successful transmission of fire weather products through AWIPS and its communications subsystems; it maintains no control over the operation of WIMS. Most products are available on the Internet, however, the Internet is not sanctioned by the NWS for the operational distribution of forecast products.

User agencies should establish a local agreement with the program leader from each NWS office on a reliable means of dissemination. While fire weather watches, red flag warnings, red flag alerts and spot weather forecasts maybe posted to NWS office websites, their primary means of dissemination to wild land fire agencies may be through a facsimile, electronic mail or another method agreed upon between the agencies served and the appropriate NWS office.

NWS offices should always coordinate with the Arkansas Forestry Commission, the USDA Forest Service and other appropriate land management agencies if a red flag event is possible.

Forecast Products

The Arkansas fire weather forecast products are now produced by five individual NWS offices. Even though all offices follow a standardized forecast with certain required elements, the actual forecast products issued by each individual NWS office may differ slightly from the formats discussed in this section due to local forecast adaptation. Local forecast adaptation may include several weather and forecast parameters not listed below.

1. Routine Fire Weather Forecasts (FWF)

Daily routine fire weather forecasts are available to anyone with an interest in land management and pre-suppression activities in Arkansas. These forecasts are issued twice a day by the NWS office with fire weather responsibilities for its particular part of Arkansas. Forecasts that are issued in the morning will include a detailed forecast of all required and localized parameters for three 12 hour forecast periods. The afternoon issuance of said forecast will include a detailed forecast of all required and localized parameters for four 12 hour forecast periods. All products will also include a three to seven day extended forecast of cloud cover, temperatures, winds and any precipitation.

A routine fire weather forecast content **must** include (1) a weather synopsis or map discussion; (2) predictions of cloud amount and precipitation, temperature and temperature trend, humidity and humidity trend and wind; (3) any optional forecast parameters and (4) an extended forecast. **Individual NWS offices have different parameters based on the feedback received by their customers.**

Current red flag status

Identification of red flag events is a primary responsibility of the forecaster producing the fire weather forecast. The purpose of fire weather watches and red flag warnings is to provide land management agencies with appropriate notification of the likelihood those weather conditions associated with the outbreak of a wildfire may occur. Any fire weather watch or red flag warning in effect will be listed here along with the area and the time the watch or warning is in effect for.

A headline is required when Red Flag Warnings and/or Fire Weather Watches are in effect. The headline will include the warning type, location, and effective time period. The location will be described in terms of geographic or other easily identified markers, such as forests, parks, cities, towns, rivers, or highways. Also, the headline for a warning and/or watch in each appropriate zone grouping. Significant trends of locally-defined critical weather elements will be headlined for non-watch or non-warning periods.

Routine Fire Weather Forecast Parameters used in NWS products

The following sections describe both the required and optional forecast parameters that are provided in the fire weather forecast products issued by NWS offices in Arkansas. *Which optional parameters are used will be determined by the individual NWS offices as they tailor their services to fit the needs of the user agencies.* NWS offices are obligated to provide user agencies with units of measure and/or a legend to explain ambiguous weather parameters.

Required Forecast Parameters

Discussion/Synopsis

The synopsis should be brief but concise enough to describe the main synoptic features adequately in order to explain the forecasted conditions. Typically the synopsis will cover the entire forecast period with the main emphasis on the first two days. The synopsis should also cover the extended period but may be more general than the discussion for the first two days. Information on weather changes such as fronts, outflow boundaries and timing of precipitation and thunderstorms are among the most critical service that the NWS can provide. These elements all can be described qualitatively in this section. Forecasters are strongly encouraged to highlight any weather changes which could pose a threat to land management or fire control efforts in a headline statement preceding the narrative discussion. Synoptic discussions should focus mainly on changes in weather conditions that would impact land management activities and planning.

Cloud amount

Sky condition trends may be discussed qualitatively in the synopsis to give the user agencies a better understanding of how other weather variables will be impacted. The predominant sky condition or trend will be forecast for the fire weather forecast zone.

Chances of precipitation

The chance of precipitation, also referred to as probability of precipitation or POP, is the likelihood of occurrence, expressed as a percentage, that *measurable* precipitation (0.01 inch or more) will occur at any point within a specified forecast area over a specific period of time (typically 12 hours). Generally, a 20% chance of precipitation means that there is a 20 in 100 (or 1 in 5) chance of precipitation occurring. Anything less than a 50% chance of precipitation is generally a forecast of no precipitation, while anything more than a 50% chance is a forecast for precipitation. However, the value of the POP has no direct relationship to the amount of rain that may occur, despite the assumption that a higher POP implies greater precipitation amounts. The POP value is actually derived from the likelihood that precipitation will occur anywhere within the specified forecast area and the percentage of the area that is expected to receive precipitation in the event it does occur. The NWS will often qualify the chance of precipitation with expressions of uncertainty or use areal coverage qualifiers for convective events.

POPS and Equivalent NWS Forecast Wording

POP	Qualifying Terms	Areal Term (Convective Only)
10 percent	Slight Chance or none	Isolated or none
20 percent	Slight Chance	Isolated
30, 40, 50 percent	Chance	Scattered
60, 70 percent	Likely	Numerous
80, 90, 100 percent	None	None

Precipitation type

A forecast of the precipitation type will accompany a probability of precipitation forecast. The predominant type of precipitation for a particular fire weather zone will be forecast if one or more types of precipitation are possible. If thunderstorms are possible, no matter how predominant when compared with other types of precipitation, they will be listed as the main type of precipitation due to the obvious impacts on fire weather.

Temperatures/Temperature Trends

Temperatures are given in degrees Fahrenheit. Temperatures have a direct impact on other weather parameters and should always be included in routine and spot forecasts. The maximum temperature will be forecast for the day period and the minimum temperature will be forecast at night. Forecasters may give one value that would be halfway between the expected range across a particular fire weather zone or a range of temperatures. Temperatures may vary greatly over a small area, especially in complex terrain and open areas compared to areas under a closed canopy of trees. Afternoon high temperatures likely will exceed the forecasted maximum in valley locations while temperatures at higher elevations are usually cooler. A 24 hour temperature trend will also be included. This will allow users to see how temperatures are trending upwards or downwards over the past 24 hours.

Relative Humidity/Relative Humidity Trends

Relative humidity is the ratio (expressed in %) of the amount of water vapor actually in the air compared to the amount the air is capable of holding at its temperature and pressure. Since relative humidity values are also critical to fire management activities, they should always be included in routine and spot forecasts. The minimum or lowest humidity will be forecast for the day period and the highest humidity at night. Relative humidity values can vary greatly over a small area due to variations in topography, vegetation and location with respect to bodies of water amongst others. One value midway between the range expected across the fire weather zone will be forecast, or a range of relative humidity will be given. Lower humidity than forecast will be typically observed in valleys during the afternoons, particularly on a sunny day. A 24 hour relative humidity trend will also be included. This will allow users to see how relative humidity is trending upwards or downwards over the past 24 hours.

Wind direction and speed

Winds at 20 feet above the ground or above the average height of vegetation are the most common winds used in the routine fire weather forecast. Forecasts will reflect the 10 minute average that is commonly measured at observation sites. Since most surface stations used for NWS forecasts measure the 2 minute wind at 33 feet, a reduction factor is needed to arrive at the 20-foot wind. The standard reduction is 70 percent. The wind direction will be forecast to eight compass points and wind speed will be expressed in miles per hour. Again, one value midway between the range expected across the fire weather zone or a range will be forecast.

Extended forecast

An extended forecast is critical to fire weather managers for planning purposes. Many prescribed burns are planned days in advance and often are dependent upon the extended portion of the fire weather forecast. Weather elements in the outlook period will include all of the mandatory day 1 and day 2 forecast elements. A wind forecast is required through 5 days and will reflect the most significant synoptically driven wind affecting fire operations or ignition. Forecasters should insert local phraseology for winds. Critical humidity conditions to 5 days, as established by local customers, will be included.

Optional Forecast Parameters**Precipitation amount**

A forecast of the expected precipitation amount that will fall over the fire weather zone will be included. Rainfall amounts are very variable, especially in convective events, and in areas of complex terrain. With that in mind, the rainfall amount forecast will be a single number that will be an average across the forecast area.

Precipitation duration

A forecast of how long the precipitation will fall over the fire weather zone during the 12 hour forecast period will be included. Rainfall duration is very variable, especially in convective events, and in areas of complex terrain. The time the precipitation is expected to fall may occur early in the forecast period, late in the forecast period or at intermittent times during the forecast cycle. When the precipitation is expected can be gleaned from the other forecast parameters or from the discussion section.

1700 foot above ground level mixing height temperature

The 1700 foot above ground level mixing height temperature will be forecast. This is the surface temperature that must be reached in order for the mixing depth to increase to the minimum criteria established by the Clean Air Act. Once the forecast temperature at the burn site reaches this temperature, it can be assumed that the mixing height above the burn site is at least 500 meters.

Mixing height

The forecast of mixing height is critical for smoke dispersion efforts of both prescribed burns and wildfire suppression. Prescribed burning is a frequent activity of land managers. Its objectives include the elimination of dead fuels to reduce the threat of extreme fire behavior, creation of a wildlife habitat or recreation area, trail management or the eradication of certain diseases. The Clean Air Act states that land managers must adhere to strict guidelines for smoke dispersion. The forecast of mixing height is one of the most widely used parameters of the fire weather forecast, is crucial to planning prescribed burns and is a critical tool for wildfire suppression. The mixing height is expressed in feet above mean sea level. For example, a forecast of 4000 feet would be the approximate mixing height above mean sea level. If burning is planned for 1000 feet of elevation, the mixing height would then be 3000 feet above ground level. The mixing height is the top of the layer through which relatively vigorous mixing will take place. It is the height at which smoke will lose its buoyancy and stop rising. A well-mixed layer is a layer in the atmosphere in which temperature drops roughly 5.5 degrees per 1000 feet of elevation. Mixing heights commonly go through large daily and seasonal variations.

Transport winds

Transport winds are defined as the average wind speed and direction for all the winds along the surface and through the mixing height. Knowledge of transport winds is a crucial factor in the effective management of smoke dispersion programs. Transport winds provide land managers with information about the horizontal dispersion (location and distance downwind from the source) of suspended particulates from prescribed fires and slash burns.

Stability

The forecast of stability classes is an attempt to qualify the degree to which vertical motion of the atmosphere is enhanced. Stability classes are dependent upon the amount of incoming solar radiation, wind speed and cloud cover. Atmospheric stability offers some clue as to how readily a pollutant will be dispersed. The more unstable the forecasted stability class, the more readily a pollutant is dispersed.

Stability Class

Stability Class	Stability Class Description
A	Extremely Unstable
B	Unstable
C	Slightly Unstable
D	Neutral
E	Slightly Stable
F	Stable

Stagnation Index

The stagnation index is a number from zero to three computed from forecast variables that are produced from a complex numerical model used by the National Weather Service. The index is used by fire managers, who are cognizant of the need to occasionally restrict open burning in order to reduce atmospheric contaminants. Therefore, managers use the index as part of the overall picture as input to issuing burning permits. A higher index correlates to greater stagnation.

Stagnation Index - Daytime Scale

Stagnation Index	Effect on Burning Operations
0	Permitted from sunrise to sunset.
1	Permitted from 1 hour after sunrise until sunset.
2	Permitted from 2 hours after sunrise until sunset.
3	Permitted from 2 hours after sunrise until 1 hour before sunset.

Stagnation Index - Nighttime Scale

Stagnation Index	Effect on Burning Operations
0	Burning permitted from sunset to sunrise.
1	Burning permitted until 2 hours before sunset.
2	Burning permitted until 4 hours after sunset.
3	No burning permitted.

Haines Index

The Haines index is an indicator of a fire's ability to spread. It combines low level instability and humidity. Instability aids updrafts, while dry low levels support fire growth. The index is a number between 2 and 6.

Haines Index

Haines Index	Effect on a fire's ability to spread
2	Very low potential for fire growth
3	Very low potential for fire growth
4	Low potential for fire growth
5	Moderate potential for fire growth
6	High Potential for fire growth

Although this is just one factor in judging the potential for fire growth, a five or six can serve as an alert that wildfires or prescribed burns may get out of control.

Ventilation Index

The ventilation index is a product of the mixing height and the transport wind speeds. It is a measure of the volume rate of horizontal transport of air within the mixing layer per unit distance normal to the winds. Units are in knot-feet. As a guide, the following categories have been established to describe the ventilation.

Ventilation Index

Ventilation Index	Effect on ventilation
150,000 kt-ft or greater	Excellent ventilation
100,000 - 149,000 kt-ft	Very good ventilation
60,000 - 99,999 kt-ft	Good ventilation
40,000 - 59,999 kt-ft	Fair Ventilation
Less than 40,000 kt-ft	Poor Ventilation

When ventilation values are less than 40,000 kt-ft along with transport winds of less than 7.0 knots, dispersion of any pollutants released into the atmosphere will be severely limited.

2. Fire Weather Watch (RFW)

Fire weather watches are issued to alert fire and land management agencies to the possibility of red flag conditions beyond the first forecast period (12 hours). The watch is issued generally 12 to 48 hours in advance of the expected conditions, but can be issued up to 72 hours in advance if the forecaster is reasonably confident. The term *FIRE WEATHER WATCH* will be headlined in the routine fire weather forecast and before each forecast group the watch is in effect for. It will also be issued as a special forecast product. The watch will remain in effect until it expires, is canceled, or upgraded to a red flag warning. A fire weather watch will not usually be issued in the first period unless there is a threat of dry lightning or scattered thunderstorms during extreme drought. If the fire weather watch is canceled before its expiration time, a new RFW will be issued to notify users that the fire weather watch is no longer in effect.

3. Red Flag Warning (RFW)

A red flag warning is used to alert fire and land management agencies that red flag conditions exist or are imminent. A red flag warning will be issued immediately when there is high confidence that red flag criteria will occur within the next 24 hours, or if those criteria are already being met. (Due to forecast uncertainty beyond 12 hours, a fire weather watch will be more often used in the 12 to 24-hour time frame.)

When a warning is issued, the term *RED FLAG WARNING* will be headlined in the routine fire weather forecast and before each forecast group the warning is in effect for. It will also be issued as a special forecast product to inform users of the warning. The warning will be continued on subsequent forecasts until no longer valid. If the red flag warning is canceled before its expiration time, a new RFW will be issued to notify users that the fire weather watch is no longer in effect.

Contents of Fire Weather Watch/Red Flag Warning:

- The headline will be the watch or warning containing a brief description of the areal coverage and the time that the watch or warning will be in effect for.
- The specific fire weather zone numbers included in the watch or warning area.
- A brief discussion of the event.
- An advisory sentence to alert the appropriate officials out in the field.

4. Spot Forecasts (FWS)

Spot forecasts are site-specific forecasts for wildfires, prescribed burns, search and rescue operations, aerial spraying, etc. By being site-specific, these forecasts take into account the effects of topography, vegetation and any nearby bodies of water. Spot forecasts contain detailed forecast information including sky condition, precipitation and thunderstorm probability, specific maximum and minimum temperature and humidity, and wind speed and direction for the specific area. Spot forecast formats are now standardized to provide the best possible services to the user agencies.

Under Volume 60 of the Federal Register 34, 969 (dated July 5, 1995), non-wildfire forecast support may only be provided to federal agencies. The NWS may not provide routine forecast support to state and local fire management agencies. However, forecast support will always be provided to any requesting agency in support of wildfire activities or any other situation which involves the protection of life and property. *This is why it is imperative that non-federal agencies requesting spot forecasts for a wildfire indicate that it is a wildfire when making the request.*

Spot forecasts are available upon request at any time of day, week or season. Consultation service is also available for planning projects for which weather might be a factor. Requests for spot forecasts will be serviced by at least one trained meteorologist. These requests will be completed as soon as possible and should typically take around 30 minutes or less. However, protection agencies should be aware that other duties (such as severe weather) may take higher priority, and short delays may occur. If excessive delays are encountered, please notify the appropriate NWS office. If the spot forecast is to support a wildfire, please inform the forecaster, or annotate the spot request form accordingly.

Requesting a Spot Forecast-

To request a spot forecast, go to the home page of the appropriate National Weather Service office. Open up the fire weather page and click on the button or link labeled "Click for spot forecast" or something similar. You will then be taken to the Spot Request Form.

Spot Request Form

Fill in this form with the information needed to request a spot forecast. The elements highlighted in red are required for us to complete your spot forecast. While the other items may not be necessary, they are very important for our ability to make an accurate and useful forecast. The more information you provide the Weather Service, the more accurate the spot forecast will be. There are several sections on the spot request form.

Project Name Section

Provide the name for your project. The name cannot be the same as any other project for the same day. You should use the buttons to indicate whether the fire is a wildfire or a prescribed burn. (Prescribed burn is the default when you enter the form). For prescribed fires, you need to indicate the ignition time and date using a 24-hour clock.

Requesting Agency Section

Here you provide your agency name, your phone number for both voice and fax (please include the area code) and your name. All this information will be helpful to us if there are problems or questions and we need to contact you.

Location Section

In this section you will provide us with the precise location of the burn. Please specify the precise latitude and longitude. If you can, please specify the name of the 7 ½ minute USGS quadmap where the burn is located. We will check that against the lat/lon location that you give to ensure it is correct. The elevation (in feet) at the top and bottom of the burn should be entered in the "Elevation" boxes. Enter the name of the nearest drainage in the "Drainage" box. Enter the slope aspect, such as NE or S (or possible FLAT or RIDGE) in the "Aspect" box. This helps us further locate the burn. Also, please enter the size of the burn (in acres) in the "Size" box.

Fuel Section

Please indicate the type of fuel, either using fuel model numbers, or a description of the fuel such as "grass", "Ponderosa Pine", etc. Also, if you can indicate the amount of fuel sheltering where the observations were taken, it helps us tremendously in providing accurate wind forecasts. Please be aware not all forecasters are familiar with fuel model types. If at all possible refer to a description of the fuel type.

Observation Section

In this section, provide us with local observations near or at the burn. For each observation we need where it is in relation to the burn, the elevation (in feet) and the time (preferably using a 24-hour clock). The wind (in miles per hour) can be specified as "N12 Gust 25" or something like that. The temperature and wet-bulb values (in degrees F) should be entered and the RH (in percent) and Dewpoint (in degrees F) can also be entered if known (they will be calculated from the Temperature/Wet-bulb/Elevation if you do not provide them). Finally, any remarks about clouds, weather or other important information should be entered in the final box. If you have more than 4 observations or if you have max/min temperatures or humidities please put them in the comments section below or fax them to the appropriate office.

Forecast Elements Section

Please provide what forecast elements you need, or are particularly important. Select the parameters that you need only for the forecast periods you need. If the forecaster believes something is particularly noteworthy, the requesting agency will be notified. If a spot request is submitted in the evening for the next day - keep in mind that you are requesting parameters for the day of the burn. For wildfires, we will provide all parameters (except smoke dispersion), so you do not need to take time filling this in, unless you have a parameter that is particularly critical.

Comments Section

If there is something else that you think we need to know, or something you couldn't fit elsewhere on the form, please enter it here.

Submit the Form

Click on the "Submit Request" button at the bottom of the page to send the request. If you want to cancel the request you can click on the "Cancel Request" button. To clear the form and start over again, you can click on the "Clear Form" button. When you submit the form, various checks are performed on the data you have entered. Some problems make it impossible for your request to be accepted (for example, if you forget to enter a name for the burn), where others will produce warnings and messages for your information. If an error is found, you will be given the opportunity to go back and fix the form, or cancel the request. As soon as your request is submitted, we will be automatically notified through our computer systems. If you have the time, we appreciate it if you could still call us, just in case something goes wrong on the web and we don't get notified of your request (especially for a wildfire).

Spot Forecast Web Page

After you have submitted a spot forecast request, an individualized spot forecast web page becomes available for that burn. This page automatically updates every minute so as new information becomes available for the burn, you see it immediately. Detailed maps of the area around the burn are generated and displayed when they become available.

Keep in mind that "sensitive" information like your name, phone number, and the exact location of the burn are NOT visible to others - only to you and the NWS.

If we have questions about your request, we may send you back a question about it. If this happens, you will see a big red box in the forecast page, with our question. Usually, there is some problem with the request that you can easily fix (use the links at the bottom of the page to change the request) or you can call us.

When your forecast is complete, it will show up in the spot forecast web page automatically, and a box to provide feedback will become available. We hope that you can provide us feedback with how the forecast worked out, perhaps later in the day or several days down the road. This feedback helps us tremendously in improving our forecasts.

In the event of Internet or other communications failure, requesting agencies are encouraged to submit requests by faxing a completed Fire Weather Spot Forecast request. This form will be the standard form submitted for fire weather support and was derived through a cooperative effort between the NWS and the AOICC. When listing the location, requests should contain both latitude/longitude coordinates, quadrangle map name and a local reference.

Forecasters should be aware of the critical weather element thresholds for the spot forecast area. These thresholds are often determined by a fire behavior analyst or other fuels/fire behavior expert and define ranges of wind, relative humidity, etc. that, if realized, may cause significant increase (or decrease) in fire behavior. In most cases, such information can be obtained directly from the on-site requester. In the case of prescribed burns, these thresholds are often defined in the "Burn Plan", which is normally developed and approved well before a spot forecast is requested.

If forecasters on duty need assistance in preparing spot forecasts for a wildfire, they should contact the forestry meteorologist at home. Specific parameters of interest to fire fighters include:

Wind speed and direction - remember we are dealing with 20 ft surface winds over the mean vegetation. The 20-ft wind may be .50 to .75 of what the airport winds are running, depending on the type of vegetation. A shift in wind direction by 30 to 40 degrees can be critical. Note terrain features which may cause local scale winds such as slope winds or valley winds or funneling.

Humidity - humidity recovery at night can be as important as minimum relative humidity during the afternoon. Ridges exposed to winds at night may allow sufficient mixing so that humidity remains lower; thus, fire activity may continue through the night.

Inversions - strength of thermal inversion should be mentioned along with a forecast of when the inversion is likely to break up.

Remember that the operations around the fire are exposed to all the weather elements that present hazards to outdoor activities, such as **lightning, thunderstorm downdraft winds, high heat index, dense fog, etc.** Notify the dispatcher at the AOICC if the spot weather forecast is unrepresentative and an update is forthcoming.

In order to make sure that spot forecasts are as accurate as possible, the NWS wishes to develop a verification scheme for spot forecasting. To assist in this effort, the NWS asks that each spot forecast request be accompanied by a preliminary observation (recorded at the time of the request) and a follow-up observation (recorded at the time of maximum or minimum heating depending upon the time that the request was sent) at the burn site, if possible. User agencies should also understand that preliminary observations are critical to giving the spot forecast a significant improvement from the routine fire weather forecast. *Note: Spot forecasts may be used as general planning tools for the following day but this practice is not recommended. "Planning" type forecast information should be obtained from the routine fire weather forecast or the zone forecast product, and can be augmented by direct phone consultation with a forecaster on duty at the appropriate NWS office. Spot forecasts are intended to support ongoing or imminent wildfire or federal prescribed burn activity only.*

5. Red Flag Alerts

The Arkansas Forestry Commission, (AFC) will provide the NWS with information on certain weather conditions which may prompt the issuance of a Red Flag Alert. This product is issued infrequently but it is an effective way to coordinate the notification of officials who have fire protection responsibility with the public.

Important: The weather criteria for notification of the AFC is similar to the NWS Red Flag Warning criteria. However, the ramification in the field is different when the state issues a Red Flag Alert.

Specifically, forecasters will notify Don McBride, AFC Dispatch whenever extreme conditions of high winds and low humidity occur in combination anywhere in the state.

Guidelines for calling the AFC contact:

1. Sustained 20 ft wind speeds of 14 mph or higher.
2. Lowest humidity expected to reach 25 percent or lower.

After notification, the AFC will discuss the condition of fuels or vegetation with the Forest Service. **The decision to issue a Red Flag Alert rests solely with the AFC.**

If the AFC decides to issue a Red Flag Alert, they will call back with information about the affected areas in the state. Forecasters should then issue a Special Weather Statement for dissemination to the media, and insure the statement gets on the appropriate NWR transmitter. The Special Weather Statement should be broadcast for one hour. Tone alerting will not be used.

Note: Issuance of these products requires good communication between NWS forecasters and land management agencies. When possible, the issuance of these products should be a joint decision between the NWS and the USDA Forest Service.

National Fire Danger Rating System (NFDRS) Site Specific Forecasts

What is NFDRS?

The National Fire Danger Rating System measures wildfire danger at key points throughout the United States. "Fire danger" in NFDRS parlance, means a daily evaluation of the potential for wildfire ignition, growth and intensity over a broad sampling area. NFDRS takes into account many different vegetative types throughout the United States, their annual growth cycles, seasonal climate trends, local topography, fuels, and the effect of daily weather changes. Fire managers receive numeric output that suggests the severity of fire danger. In general, one or more fire weather observation sites are carefully located in the forest that will represent the worst conditions. Observations are taken once per day. Ideally, the NFDRS weather observations are taken at the hottest, driest and windiest time of the afternoon. This is because NFDRS is supposed to model the "worst case" fire conditions possible during the day. The ideal site would be one on a south and west facing aspect with no nearby obstructions. In reality, few locations meet these stringent criteria. The NFDRS is not intended to be "site specific" like the Fire Behavior Prediction System but rather a general overview of fire danger. Effective fire suppression planning depends heavily on NFDRS because it is an objective tool for predicting the difficulty of suppressing a wildfire.

The National Weather Service role in NFDRS is forecasting weather trends which allow NFDRS to **predict** the next day's fire danger indices. Daily weather observations entered into NFDRS by the fire agencies form the basis of the trend forecast input by the NWS. Each NFDRS reporting site is located at a spot which is supposed to be representative of the terrain and fuel types dominant in that area. Most NFDRS reporting sites are also RAWS (Remote Automated Weather Station) stations whose weather information is available on the internet or through WIMS (Weather Management and Information System). The basic time of observation each day is 1 PM CST or 2 PM CDT. The observation should be entered into WIMS no later than 145 PM CST or 245 PM CDT.

There is a total of six of these sites in the state of Arkansas. The National Weather Service is obligated to prepare a site specific forecasts for four of these NFDRS sites. Forecasts are currently optional for the sites in Jessieville and Booneville and will be completed on a time permitting basis. These forecasts should be entered into the NWS computer system no later than 345 PM CST/CDT and will be available in WIMS shortly thereafter. Site specific forecasts are issued for the following locations

NFDRS Site Specific Forecast Points

Site	Site ID Number	Elevation	Lat /Lon	County
Strickler	030901	1630 feet	35.87 N / 94.30 W	Washington
Silver Hill	031201	928 feet	35.97 N / 92.75 W	Searcy
Devils Knob	032001	2099 feet	35.62 N / 93.33 W	Johnson
Booneville	033001	656 feet	35.15 N / 93.90 W	Logan
Oden	034702	895 feet	34.62 N / 93.8 W	Montgomery
Jessieville	034802	898 feet	34.65 N / 93.06 W	Garland

The NFDRS forecast consists of two separate and distinct parts. The first part is a time specific forecast for the basic time of observation (1 PM CST or 2 PM CDT). **Note:** Remember the NFDRS weather observations are at what is supposed to be the hottest, driest and windiest time of the afternoon. Thus, the time specific forecast is made for this time. The second part is a forecast for certain parameters during the 24 hours between the basic observation time on the day the forecast is being prepared and the basic observation time for the following day. The single station forecast is in tabular form with the terminology as follows:

1. State of Weather

The state of weather is input as a code, based on the following table, for the weather expected at basic observation time the next day. Forecasters will select the highest code when more than one type of weather is expected. For example, if both fog and rain are anticipated at basic observation time, the state of weather would be coded as six, the higher state of weather code.

Weather Codes for Single Station Forecasts

Weather Code	Sensible Weather
0	Clear Skies
1	Scattered Clouds
2	Broken Clouds
3	Overcast Conditions
4	Fog
5	Drizzle
6	Rain
7	Snow
8	Showers
9	Thunderstorms

2. Temperature and humidity

The forecaster will enter the expected temperature in degrees Fahrenheit, and the relative humidity in whole percent expected at basic observation time.

3. Wind direction and speed

The forecaster will enter the expected wind direction in degrees and the expected wind speed at the observation site in mph. The wind speed at a fire weather station is the average of the speed measured over a 10 minute period. Wind speeds measured at a fire weather station usually do not compare with the ASOS 10 meter winds measured at airports. Wind speeds are observed to be lower over the rougher terrain of a forest as compared to the observation site at an airport. The 10 minute average wind at the 20 foot level will produce lower wind speeds than the 2 minute ASOS winds. The forecast wind speed will reflect the lower wind speeds at fire weather stations by reducing the forecast wind speed by a factor that is currently 70%.

4. 24 hour forecasts

The forecaster will follow the basic observation time forecasts with the maximum temperature expected during the 24 hour period from basic observation time the day the forecast is being prepared to the basic observation time the following day. This is followed by a forecast of minimum temperature, maximum humidity and minimum humidity expected in the same 24-hour time frame.

5. Precipitation time duration

The forecaster will next enter the expected duration of precipitation in whole hours that will fall at the site for the first 16 hours of the forecast between basic observation times. This 16 hour forecast will be followed by a forecast of the expected duration of precipitation in whole hours that will fall at the site for the final eight hours of the forecast between basic observation times.

6. Wet Fuels Condition

A wet fuels condition anticipated at the next basic observation time is entered next. If the forecaster expects fuels to be wet at the next basic observation time, a Y for yes will be entered. If the forecaster feels fuels will not be wet at the next basic observation time, an N for no will be entered. Basically, this parameter will be yes when liquid water, ice or snow, will be sitting on the fuels at observation time, i.e. really soaked ! **Use yes with caution, all indices in the NFDRS are set to zero when wet fuels are forecast.**

Update policy An agreement is in effect with the AOICC (Arkansas Oklahoma Interagency Coordination Center), located in Hot Springs, concerning updates and significant changes in sensible weather. The fire management officers check the morning forecast before heading out into the field and will not be aware if an update is issued. If an update is issued, please call the AOICC at 501-321-5232 to inform them an update has been issued. They will notify personnel in the field. If a significant change in the weather is likely to occur, please call the AOICC and tell them what is going on. They are interested in strong to severe thunderstorms approaching the forests, sudden wind shifts, a drastic rise in temperature or a drastic drop in humidity. This agreement will eliminate the forecasters from calling specific districts. The forecaster only has to call the AOICC and they will notify the personnel in the field as applicable. Remember, people may be burning every day during fire season and sudden drastic weather changes may affect fire behavior and more important, pose a hazard to the people in the field.

National Weather Service Offices

All NWS offices issue spot fire weather forecasts on an as needed basis. Although the procedure to request a spot forecast has been standardized, it may vary slightly between offices due to local policy and customer requests.

NWS Little Rock

8400 Remount Rd

North Little Rock, AR 72118

Phone: 501-834-3955 Fax: 501-834-2019

Internet address: <http://www.srh.noaa.gov/lzk>

Meteorologist in Charge: Renee Fair

Fire weather program leader: Joe Goudsward

The Little Rock National Weather Service Office has responsibility for fire weather services in the following counties in Arkansas:

Arkansas	Conway	Hot Spring	Lonoke	Polk	Stone
Baxter	Dallas	Independence	Marion	Pope	Van Buren
Boone	Desha	Izard	Montgomery	Prairie	White
Bradley	Drew	Jackson	Monroe	Pulaski	Woodruff
Calhoun	Faulkner	Jefferson	Newton	Saline	Yell
Clark	Fulton	Johnson	Ouachita	Scott	
Cleveland	Garland	Lincoln	Perry	Searcy	
Cleburne	Grant	Logan	Pike	Sharp	

National Fire Danger Rating System Single Station Forecast Sites:

Station Name	County
Booneville	Logan
Devils Knob	Johnson
Jessieville	Garland
Oden	Montgomery
Silver Hill	Searcy

Federal Land Agencies Served:

Ouachita National Forest	Cache River/Bald Knob National Wildlife Refuge	Hot Springs National Park
Ozark National Forest	Holla Bend National Wildlife Refuge	Arkansas Post National Monument
Buffalo National River	White River National Wildlife Refuge	Felsenthal/Overflow National Wildlife Refuge

Red Flag Criteria:

For a red flag event, all three of the following criteria must be met.

1. Afternoon minimum relative humidity expected to be 25% or lower.
2. 20 foot sustained winds of 14 mph or greater.
3. Fuels that are determined to be critically dry. Values less than 10 percent are considered critical for 10 hour fuels.

Routine Fire Weather Products Issued:

Fire Weather Forecast (product identifier LITFWFLIT; WMO Header FNUS54 KLZK):

Fire weather forecasts from the Little Rock NWS office are issued twice a day. The first issuance is in the morning around 730 am and the latter is an update around 330 pm. In addition to the required forecast parameters and information on any fire weather watches and red flag warnings in effect, the routine fire weather forecast offers additional parameters, including precipitation amount, precipitation type, 500 m/1700 ft mixing height temperatures, mixing heights, mean transport wind speed and direction, wind shift, the speed of the wind shift and the time the wind shift will occur. An example of the Little Rock Fire Weather Forecast is included in Appendix 9.

NWS Memphis

7777 Walnut Grove Road-OM1

Memphis, TN 38120

Phone: 901-544-0401 Fax: 901-544-0414

Internet address: <http://www.srh.noaa.gov/meg>

Meteorologist in Charge: James Duke

Fire weather program leader: Gene Rench

The Memphis National Weather Service Office has responsibility for fire weather services in the following counties in Arkansas:

Clay	Crittenden	Green	Lee	Phillips	Randolph
Craighead	Cross	Lawrence	Mississippi	Poinsett	St Francis

National Fire Danger Rating System Single Station Forecast Sites: None

Federal Land Agencies Served:

<u>St Francis National Forest</u>	Big Lake National Wildlife Refuge	Wapanoca National Wildlife Refuge
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Red Flag Criteria:

For a red flag event, both of the following criteria must be met.

1. Afternoon minimum relative humidity expected to be 25% or lower.
2. 20 foot sustained winds of 14 mph or greater.

Routine Fire Weather Products Issued:

Fire Weather Forecast (product identifier MEMFWFMEM; WMO Header FNUS54 KMEG):

Fire weather forecasts from the Memphis NWS office are issued twice a day. The first issuance is in the morning around 6 am and the latter is an update at around Noon. In addition to the required forecast parameters and information on any fire weather watches and red flag warnings in effect, the routine fire weather forecast offers additional parameters, including precipitation amount, precipitation duration, precipitation beginning and ending time, morning and afternoon 20 foot winds, 500 m/1700 ft mixing height, 500 m/1700 ft mixing height transport speed (MPH and meters per second), and stagnation index. An example of the Memphis Fire Weather Forecast is included in Appendix 9.

NWS Tulsa

10159 E. 11th St. Suite 300

Tulsa, OK 74128

Phone Number: 918-832-4116 Fax: 918-832-4101

Internet address: <http://www.srh.noaa.gov/tulsa>

Meteorologist in Charge: Steven Piltz

Fire weather program leader: Rich Uber

The Tulsa National Weather Service Office has responsibility for fire weather services in the following counties in Arkansas:

Benton	Crawford	Madison	Washington
Carroll	Franklin	Sebastian	

National Fire Danger Rating System Single Station Forecast Sites:

Station name	County
Strickler	Washington

Federal Land Agencies Served:

Ouachita National Forest	Pea Ridge National Military Park
Ozark National Forest	Fort Smith National Historic Site

Red Flag Criteria;

For a red flag event, all three of the following criteria must be met.

1. Afternoon minimum relative humidity expected to be 25% or lower.
2. 20 foot sustained winds of 14 mph or greater.
3. Fuels that are determined to be critically dry. Values less than 10 percent are considered critical for 10 hour fuels.

Routine Fire Weather Products issued:

Fire Weather Forecast (product identifier OKCFWFTUL; WMO Header FNUS54 KTSA): Fire weather forecasts from the Tulsa NWS office are issued twice a day. The first issuance is in the morning around 7 am and the latter is an update at around 4 pm. In addition to the required forecast parameters and information on any fire weather watches and red flag warnings in effect, the routine fire weather forecast offers additional parameters, including precipitation amount, precipitation duration, 500 m/1700 ft mixing height temperatures, mixing heights, mean transport wind speed, morning and afternoon 20 foot winds and ventilation rate. An example of the Tulsa Fire Weather Forecast is included in Appendix 9.

NWS Shreveport

5655 Hollywood Ave.

Shreveport, LA 71109

Phone: 318-636-7345 Fax: 318-636-9620

Internet address: <http://www.srh.noaa.gov/shv>

Meteorologist in Charge: Lee Harrison

Fire weather program leader: Bill Adams

The Shreveport National Weather Service Office has responsibility for fire weather services in the following counties in Arkansas:

Columbia	Lafayette	Nevada
Hempstead	Little River	Sevier
Howard	Miller	Union

National Fire Danger Rating System Single Station Forecast Sites: None

Federal Land Agencies Served: Felsenthal/Overflow National Wildlife Refuge

Red Flag Criteria:

For a red flag event, all three of the following criteria must be met.

1. Afternoon minimum relative humidity expected to be 25% or lower.
2. 20 foot sustained winds of 14 mph or greater.
3. Fuels that are determined to be critically dry. Values less than 10 percent are considered critical for 10 hour fuels.

Routine Fire Weather Products Issued:

Fire Weather Forecast (product identifier NEWFWFSHV; WMO Header FNUS54 KSHV): Fire weather forecasts from the Shreveport NWS office are issued twice a day. The first issuance is in the morning around 7 am and the latter is an update at around 3 pm. In addition to the required forecast parameters and information on any fire weather watches and red flag warnings in effect, the routine fire weather forecast offers additional parameters, including precipitation amount, precipitation duration, 500 m/1700 ft mixing height temperatures, maximum and minimum mixing heights (meters and feet MSL), mean transport wind speed (meters/second and miles/hour) and direction in the mixing layer, ventilation index, and category day. An example of the Shreveport Fire Weather Forecast is included in Appendix 9.

NWS Jackson

234 Weather Service Drive

Jackson, MS 39208

Phone: 601-939-2786 Fax: 601-965-4028

Internet address: <http://www.srh.noaa.gov/lzk>

Meteorologist in Charge: Jim Stefkovich

Fire weather program leader: Marc McAllister

The Jackson National Weather Service Office has responsibility for fire weather services in the following counties in Arkansas:

Ashley	Chicot
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National Fire Danger Rating System Single Station Forecast Sites: None

Federal Land Agencies Served: Felsenthal/Overflow National Wildlife Refuge

Red Flag Criteria:

For a red flag event, all three of the following criteria must be met.

1. Afternoon minimum relative humidity expected to be 25% or lower.
2. 20 foot sustained winds of 14 mph or greater.
3. Keetch-Byram Drought Indexes of greater than 700.

Routine Fire Weather Products issued:

Fire Weather Forecast (product identifier JANFWFJAN; WMO Header FNUS54 KJAN):

Fire weather forecasts from the Jackson NWS office are issued twice a day. The first issuance is in the morning around 8 am and the latter is an update around 2 pm. In addition to the required forecast parameters and information on any fire weather watches and red flag warnings in effect, the routine fire weather forecast offers additional parameters, including precipitation amount, precipitation duration, 500 m/1700 ft mixing height temperatures, mixing heights (meters and feet MSL), mean transport wind speed (meters/second and miles/hour), stagnation index, ventilation index, both morning and afternoon winds and category day. An example of the Jackson Fire Weather Forecast is included in Appendix 9.

Appendix 1: Wildland Fire Terminology



Aerial Fuels: All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

Aerial Ignition: Ignition of fuels by dropping incendiary devices or materials from aircraft.

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, or county government organization participating with jurisdictional responsibilities.

Anchor Point: An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Aspect: Direction toward which a slope faces.

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (See also Bladder Bag.)

Bambi Bucket: A collapsible bucket slung below a helicopter. Used to dip water from a variety of sources for fire suppression.

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength nylon fabric fitted with a pump. (See also Backpack Pump.)

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (See Flare-up.)

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.

Bucket Drops: The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.

Buffer Zones: An area of reduced vegetation that separates wildlands from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Bump-up Method: A progressive method of building a fire line on a wildfire without changing relative positions in the line. Work is begun with a suitable space between workers. Whenever one worker overtakes another, all workers ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until completing his or her space.

Burn Out: Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

Campfire: As used to classify the cause of a wildland fire, a fire that was started for cooking or warming that spreads sufficiently from its source to require action by a fire control agency.

Candle or Candling: A single tree or a very small clump of trees which is burning from the bottom up.

Chain: A unit of linear measurement equal to 66 feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

Cold Trailing: A method of controlling a partly dead fire edge by carefully inspecting and feeling with the hand for heat to detect any fire, digging out every live spot, and trenching any live edge.

Command Staff: The command staff consists of the information officer, safety officer and liaison officer. They report directly to the incident commander and may have assistants.

Complex: Two or more individual incidents located in the same general area which are assigned to a single incident commander or unified command.

Contain a fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Coyote Tactics: A progressive line construction duty involving self-sufficient crews that build fire line until the end of the operational period, remain at or near the point while off duty, and begin building fire line again the next operational period where they left off.

Creeping Fire: Fire burning with a low flame and spreading slowly.

Crew Boss: A person in supervisory charge of usually 16 to 21 firefighters and responsible for their performance, safety, and welfare.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Curing: Drying and browning of herbaceous vegetation or slash.

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Deployment: See Fire Shelter Deployment.

Detection: The act or system of discovering and locating fires.

Direct Attack: Any treatment of burning fuel, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

Dispatcher: A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Division: Divisions are used to divide an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the span-of-control of the operations chief. A division is located with the Incident Command System organization between the branch and the task force/strike team.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

Drip Torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

Drop Zone: Target area for air tankers, helitankers, and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

Energy Release Component (ERC): The computed total heat released per unit area (British thermal units per square foot) within the fire front at the head of a moving fire.

Engine: Any ground vehicle providing specified levels of pumping, water and hose capacity.

Engine Crew: Firefighters assigned to an engine. The Fireline Handbook defines the minimum crew makeup by engine type.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."

Environmental Assessment (EA): EAs were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Equilibrium Moisture Content: Moisture content that a fuel particle will attain if exposed for an infinite period in an environment of specified constant temperature and humidity. When a fuel particle reaches equilibrium moisture content, net exchange of moisture between it and the environment is zero.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won't burn, natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire which has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

Faller: A person who fells trees. Also called a sawyer or cutter.

Field Observer: Person responsible to the Situation Unit Leader for collecting and reporting information about an incident obtained from personal observations and interviews.

Fine (Light) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather and topography.

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the Planning Section Chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather and topography.

Fire Break: A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Perimeter: The entire outer edge or boundary of a fire.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface indrafts, near and beyond the perimeter, and sometimes by tornado-like whirls.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold and monitor prescribed fires.

Fire Weather: Weather conditions that influence fire ignition, behavior and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash, that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, shrubs and trees, that feed a fire. (See Surface Fuels.)

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fusee: A colored flare designed as a railway warning device and widely used to ignite suppression and prescription fires.

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust, that normally support a glowing combustion without flame.

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head of a Fire: The side of the fire having the fastest rate of spread.

Heavy Fuels: Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Helitack: The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.

Helitack Crew: A group of firefighters trained in the technical and logistical use of helicopters for fire suppression.

Holding Actions: Planned actions required to achieve wildland prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions.

Holding Resources: Firefighting personnel and equipment assigned to do all required fire suppression work following fireline construction but generally not including extensive mop-up.

Hose Lay: Arrangement of connected lengths of fire hose and accessories on the ground, beginning at the first pumping unit and ending at the point of water delivery.

Hotshot Crew: A highly trained fire crew used mainly to build fireline by hand.

Hotspot: A particular active part of a fire.

Hotspotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are executed. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy(ies), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Infrared Detection: The use of heat sensing equipment, known as Infrared Scanners, for detection of heat sources that are not visually detectable by the normal surveillance methods of either ground or air patrols.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions and the required safety equipment to ensure public and employee safety.

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suite worn by smokejumpers.

Keech Byram Drought Index (KBDI): Commonly-used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 80 (maximum drought).

Knock Down: To reduce the flame or heat on the more vigorously burning parts of a fire edge.

Ladder Fuels: Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Large Fire: 1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Lead Plane: Aircraft with pilot used to make dry runs over the target area to check wing and smoke conditions and topography and to lead air tankers to targets and supervise their drops.

Light (Fine) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Lightning Activity Level (LAL): A number, on a scale of 1 to 6, that reflects frequency and character of cloud-to-ground lightning. The scale is exponential, based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Line Scout: A firefighter who determines the location of a fire line.

Litter: Top layer of the forest, scrub land, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

Micro-Remote Environmental Monitoring System (Micro-REMS): Mobile weather monitoring station. A Micro-REMS usually accompanies an incident meteorologist and ATMU to an incident.

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Modular Airborne Firefighting System (MAFFS): A manufactured unit consisting of five interconnecting tanks, a control pallet, and a nozzle pallet, with a capacity of 3,000 gallons, designed to be rapidly mounted inside an unmodified C-130 (Hercules) cargo aircraft for use in dropping retardant on wildland fires.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Multi-Agency Coordination (MAC): A generalized term which describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents, and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group: A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum

Nomex ®: Trade name for a fire resistant synthetic material used in the manufacturing of flight suits and pants and shirts used by firefighters (see Aramid).

Normal Fire Season: 1) A season when weather, fire danger, and number and distribution of fires are about average. 2) Period of the year that normally comprises the fire season.

Operations Branch Director: Person under the direction of the operations section chief who is responsible for implementing that portion of the incident action plan appropriate to the branch.

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

Pack Test: Used to determine the aerobic capacity of fire suppression and support personnel and assign physical fitness scores. The test consists of walking a specified distance, with or without a weighted pack, in a predetermined period of time, with altitude corrections.

Paracargo: Anything dropped, or intended for dropping, from an aircraft by parachute, by other retarding devices, or by free fall.

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

Personnel Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to: 8-inch high-laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves and individual first aid kits.

Preparedness: Condition or degree of being ready to cope with a potential fire situation

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Project Fire: A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

Radiant Burn: A burn received from a radiant heat source.

Radiant Heat Flux: The amount of heat flowing through a given area in a given time, usually expressed as calories/square centimeter/second.

Rappelling: Technique of landing specifically trained firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Red Card: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (Rh): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resources: 1) Personnel, equipment, services and supplies available, or potentially available, for assignment to incidents. 2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.

Resource Management Plan (RMP): A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Resource Order: An order placed for firefighting or support resources.

Retardant: A substance or chemical agent which reduced the flammability of combustibles.

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

Running: A rapidly spreading surface fire with a well-defined head.

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity.

Scratch Line: An unfinished preliminary fire line hastily established or built as an emergency measure to check the spread of fire.

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnormal increase in the fire potential and/or danger.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken underscore trees or brush.

Sling Load: Any cargo carried beneath a helicopter and attached by a lead line and swivel.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Smokejumper: A firefighter who travels to fires by aircraft and parachute.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Smoldering Fire: A fire burning without flame and barely spreading.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotter: In smoke jumping, the person responsible for selecting drop targets and supervising all aspects of dropping smokejumpers.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Strike Team: Specified combinations of the same kind and type of resources, with common communications, and a leader.

Strike Team Leader: Person responsible to a division/group supervisor for performing tactical assignments given to the strike team.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, Forb, low and medium shrubs, tree seedlings, heavier branchiopod, downed logs, and stumps interspersed with or partially replacing the litter.

Scamper: (1) A worker who assists Faller and/or sawyers by clearing away brush, limbs and small trees. Carries fuel, oil and tools and watches for dangerous situations. (2) A worker on a dozer crew who pulls winch line, helps maintain equipment, etc., to speed suppression work on a fire.

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Temporary Flight Restrictions (TAR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident which restricts the operation of nonessential aircraft in the airspace around that incident.

Terra Torch ®: Device for throwing a stream of flaming liquid, used to facilitate rapid ignition during burn out operations on a wildland fire or during a prescribed fire operation.

Test Fire: A small fire ignited within the planned burn unit to determine the characteristic of the prescribed fire, such as fire behavior, detection performance and control measures.

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Tolling of the Bells: Before the telephone was commonplace, fire departments would use the telegraph to communicate. When a firefighter fell in the line of duty, the fire alarm office would tap out a signal. This was done for the purpose of notification, and as a sign of honor and respect for all firefighters who had made the ultimate sacrifice to serve their communities. This would be tapped out as five measured dashes, then a pause, then five measured dashes, then a pause, then five more measured dashes. Such symbolism has been a time-honored tradition, and is repeated at each service of a fallen firefighter.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Two-way Radio: Radio equipment with transmitters in mobile units on the same frequency as the base station, permitting conversation in two directions using the same frequency in turn.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

Uncontrolled Fire: Any fire which threatens to destroy life, property, or natural resources, and

Underfur: A fire that consumes surface fuels but not trees or shrubs. (See Surface Fuels.)

Vectors: Directions of fire spread as related to rate of spread calculations (in degrees from up slope).

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Weather Information and Management System (WHIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource management agencies. Provides timely access to weather forecasts, current and historical weather data, the National Fire Danger Rating System (NFDRS), and the National Interagency Fire Management Integrated Database (NIFMID).

Wet Line: A line of water, or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire.

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific predated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

Wildland Urban Interface: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Wind Vectors: Wind directions used to calculate fire behavior.

Appendix 2: National Weather Service Southern Region Fire Weather Program Leaders and IMETS

Southern Region Fire Weather Meteorologist: Paul Witsaman
819 Taylor Street, Room 10A26
Fort Worth, TX 76102
Phone: 817-978-1100 x116



1. Albuquerque, NM
Fire Weather Program Leader: Brent Wachter (IMET)
Phone: 505-244-9148

2. Amarillo, TX
Fire Weather Program Leader: Ken Schneider
Phone: 806-335-9022



3. Atlanta, GA
Fire Weather Program Leader: Dean Hutsell (IMET Trainee)
Phone: 770-486-1133

4. Austin/San Antonio, TX
Fire Weather Program Leader: Monte Oaks (IMET Trainee)
Phone: 830-629-0205

5. Birmingham, AL
Fire Weather Program Leader: Mark Rose
Phone: 205-621-5645

6. Brownsville, TX
Fire Weather Program Leader: Kurt Vanspeybroeck
Phone: 956-504-3084

7. Corpus Christi, TX
Fire Weather Program Leader: Mike Buchanan
Phone: 361-289-0725

8. El Paso, TX
Fire Weather Program Leader: Tom Bird (IMET)
Phone: 505-589-3982

9. Fort Worth, TX

Fire Weather Program Leader: Joe Harris

Phone: 817-831-1595

10. Huntsville, AL

Fire Weather Program Leader: Steve Shumway

Phone: 256-890-8503

11. Houston/Galveston, TX

Fire Weather Program Leader: Kent Prochazka (IMET Trainee)

Phone: 281-534-3876

12. Jackson, MS

Fire Weather Program Leader: Marc McCallister

Mike Edmonston (IMET)

Phone: 601-939-2786

13. Jacksonville, FL

Fire Weather Program Leader: Marie Trabert

Phone: 904-741-4411

14. Key West, FL

Fire Weather Program Leader: Alan Albanese

Phone: 305-295-1316

15. Knoxville/Tri-Cities, TN

Fire Weather Program Leader: David Hotz

Phone: 423-586-8400

16. Lake Charles, LA

Fire Weather Program Leader: Kent Kuyper (IMET Trainee)

Phone: 337-477-3422

17. Little Rock, AR

Fire Weather Program Leader: Joe Goudsward (IMET)

Phone: 501-834-3955

18. Lubbock, TX

Fire Weather Program Leader: Jose Valdez

Phone: 806-745-3980

19. Melbourne, FL

Fire Weather Program Leader: Pete Blottman

Phone: 321-259-7618

20. Memphis, TN

Fire Weather Program Leader: Gene Rench

Phone: 901-544-0357

21. Miami, FL

Fire Weather Program Leader: Joel Rothfuss (IMET Trainee)

Phone: 305-229-4523

22. Midland/Odessa, TX

**Fire Weather Program Leader: Greg Murdoch (IMET)
Seth Nagle (IMET Trainee)**

Phone: 915-563-6217

23. Mobile, AL

Fire Weather Program Leader: Eric Christensen

Phone: 334-633-2471

24. Nashville, TN

Fire Weather Program Leader: John Cohen

Phone: 615-754-8502

25. New Orleans, LA

Fire Weather Program Leader: Freddie Zeigler

Phone: 504-645-0565

26. Oklahoma City/Norman, OK

Fire Weather Program Leader: Scott Curl

Phone: 405-366-6584

27. San Angelo, TX

Fire Weather Program Leader: Chris Holguin

Phone: 915-949-0715

28. San Juan, PR

Fire Weather Program Leader: Hank Laskosky

Phone: 787-253-7865

29. Shreveport, LA

Fire Weather Program Leader: Bill Adams

Phone: 318-636-7345

30. Tallahassee, FL

Fire Weather Program Leader: Marty Trexler

Phone: 850-942-9398

31. Tampa Bay, FL

**Fire Weather Program Leader: David Rittenberry
Rick Davis (IMET)**

Phone: 813-641-2512

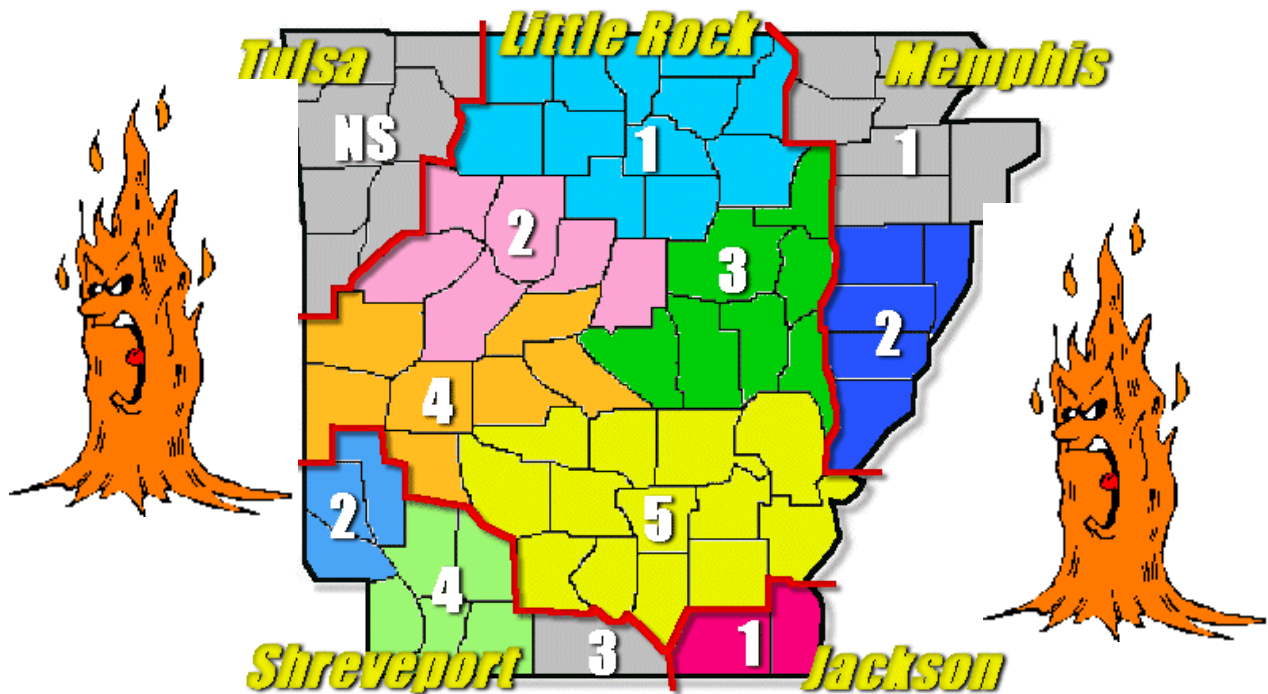
32. Tulsa, OK

Fire Weather Program Leader: Rich Uber

Phone: 918-832-4116



Appendix 3 Fire Weather Zones



Little Rock

Zone 1 - Ozark National Forest/Buffalo National River

Zone 2 - Arkansas River Valley

Zone 3 - Central Arkansas

Zone 4 - Ouachita National Forest

Zone 5 - South Arkansas

Shreveport

District 2, 3, and 4 (Southwest and South Central Arkansas)

Memphis

Zone 1 - Northeast Arkansas

Zone 2 - East Central Arkansas and St. Francis National Forest

Jackson

Zone 1 - Extreme Southeast Arkansas

Tulsa

Non-Static - Northwest Arkansas

Appendix 4: National Fire Plan

NATIONAL AGREEMENT FOR METEOROLOGICAL SERVICES IN SUPPORT OF AGENCIES WITH LAND MANAGEMENT AND FIRE PROTECTION RESPONSIBILITIES



I. Introduction

This National Agreement is between the National Weather Service (NWS) and agencies with land management and fire management responsibilities signatory to this agreement. They are referred to in this agreement as “NWS” and “USER AGENCIES,” respectively. The User Agencies are responsible for the maintenance, improvements, and protection of the wild lands, owned or held in trust by the United States. Accurate and timely weather information is required to manage effectively and efficiently this valuable national resource. The NWS has the expertise, organization, and legal charter to satisfy this need nationally. It is with this knowledge that this

Agreement is entered into. Its purpose is to combine resources so as to best serve the needs of the public and to fulfill the obligations of the respective agencies.

II. Authority

This agreement is authorized under the Economy Act (31 U.S.C. 686; 15 U.S.C. 313; 49 U.S.C. 1463) and the Cooperative Forestry Assistance Act of 1978 (16 U.S.C. 2101), etc.

III. Objectives

The objectives of this Agreement are to identify meteorological services to be provided, establish the interagency relationships, and define financial and other obligations of the NWS and User Agencies.

IV. Responsibilities

A. National Weather Service

Basic Meteorological services will be provided during normal working hours in accordance with Operating Plans for designated NWS offices to the extent of NWS fire weather resources. NWS regional headquarters will identify to the User Agency headquarters a list of the designated fire weather offices on an annual basis. These services will be made available without cost and may include:

- Routine daily fire weather forecasts
- Outlooks and discussions
- Weather observations
- Red flag forecasts

Spot forecasts
Prescribed burn forecasts
Smoke management forecasts and information
Consultation and technical advice
Amendments / updates

Fire Weather Training- The NWS recognizes the need for training in fire weather meteorology for NWS forecasters. To the extent of available resources, the NWS will meet this need.

Special meteorological services- These services will be provided by designated NWS offices on a reimbursable basis as stated in Section IV B.

Weather observer training
Weather observation station visitations
Participation in User Agency training activities
Course development carried out at User Agency facilities
Classroom training
On-site meteorological services
Other special services

B. User Agencies -

The following services and resources will be provided by User Agencies:

Fire-management computer systems- Where existing fire management computer systems are locally available, access to the system will be provided.

Fire weather observations- Provide daily surface weather observations and enter data into fire management computer systems.

Provide all equipment, equipment maintenance, and inspection of weather observing sites.

Meet all travel and per diem costs associated with User Agencies' requests for visits of NWS personnel to weather-observing sites

Provide for collection of remote automatic weather systems data and entry into the fire management computer system.

Provide observations for site-specific and other special forecasts.

On-site meteorological support - Meet costs directly associated with on-site meteorological support by NWS personnel. This includes costs incurred by the backup NWS office. Provide logistical and weather observation support to NWS personnel at on-site operations.

Provide access to telecommunication services where available.

Meet per diem and travel costs for NWS personnel participating in the conduct of User Agency training.

Provide technical assistance, instruction, and supporting material for NWS sponsored training sessions.

Other special services- User Agencies will provide logistics support and meet all overtime, travel, and per diem costs of NWS personnel associated with the provision of all other special services.

C. Joint Responsibilities -

NWS and User Agencies shall prepare an annual Operating Plan for individual fire weather office areas of responsibility. This plan will identify the basic weather services covered under Section IV.

V. Procedures for requesting services

Procedures for ordering services will be specified in Operating Plans for each NWS fire weather office.

VI. Billing Procedures

Costs to be recovered from User Agencies will be calculated on the basis of expense reports submitted to the NWS regional headquarters by field personnel. Copies of expense reports will be forwarded to appropriate User Agencies by NWS regional headquarters. This procedure will enable agencies to accurately determine costs to be reimbursed during a given fiscal year. Billing of User Agencies will be accomplished by NWS regional submission of appropriate expense reports to the NOAA Reimbursables Division. Bills will include a statement of service rendered, dates it was provided, and location where provided. All questions relating to billing procedures, charges, current costs, and individual expense reports should be directed to the appropriate NWS regional contact or the NWS Technical Monitor.

VII. Amendments

Upon written notice, the terms of this Agreement are subject to amendment at any time by mutual agreement of the parties. The signatory agencies agree to consider expansion of this Agreement to cover areas of mutual concern, e.g., changing technology and improved procedures, as opportunities for such cooperation become available.

VIII. Terms of National Agreement

1. The terms of this Agreement shall become effective upon execution by NWS and any or all User Agencies and shall remain in effect until such times as the Agreement is terminated by mutual agreement. Any agency may withdraw at any time by ninety (90) days written notice to all parties.

2. This Agreement does not constitute a financial obligation for any party in excess of appropriations authorized by law and administratively allocated for the purposes intended.

IX. Technical Monitor For NWS

Fire Weather Program Manager, W/OM12

NOAA/National Weather Service

1325 East-West Highway

Silver Spring, MD 20910

Telephone: (301) 713-1677 ext. 131

Definitions

When the following terms are used in this Agreement or in an operating plan, such terms will have the meanings stated below.

1. Fire Weather Office Operating Plan

A procedural guide which describes the services provided within the area of a fire weather office's responsibility.

2. Basic Meteorological Services

Basic meteorological services are those state-of-the-science meteorological forecasts, warnings, observations, and statements produced in a designated NWS fire weather office during normal working hours.

3. Fire Weather Zone or District

A fire weather zone or district is the area of routine service responsibility as defined by the NWS. This area is usually defined by climatological factors, but may be modified somewhat to the administrative boundaries of the User Agencies.

4. Normal Working Hours

Normal working hours are defined in the Operating Plan, but usually cover 8-hour workdays, Monday through Friday, except during fire season when the normal hours cover 7 days a week

5. Prescribed Fire

Prescribed fire is a fire burning in wildland fuels according to a planned prescription and confined within planned boundaries for the purpose of achieving specific objectives of resource management. (Prescribed burning is the practice of prescribed fire use.)

6. Red Flag

Red flag is a program which highlights the onset of critical weather conditions conducive to extensive wildfire occurrences.

7. Special Meteorological Services

Meteorological services uniquely required by User Agencies which cannot be provided at a designated NWS fire weather office during normal working hours.

8. Spot Forecasts

Spot forecasts are site-specific weather forecasts. They are issued upon request of User Agencies for wildfire, prescribed burns, or special projects.

9. On-site

That special service which dedicates a fire weather forecaster to a wildfire, prescribed fire, or special project such that the fire weather forecaster is removed from providing basic services at his/her assigned weather office.

Appendix 5: Fire Links

National Weather Service Links:

National Weather Service - <http://www.nws.noaa.gov>
National Weather Service Fire Weather Program-
<http://tgs5.nws.noaa.gov/om/fire.htm>
Southern Region Fire Weather -<http://www.srh.noaa.gov/firewx/>
National Fire Weather Products -
<http://www.boi.noaa.gov/firewx.htm>
Storm Prediction Center - <http://www.spc.noaa.gov/fire/>
NWS Little Rock - <http://www.srh.noaa.gov/lzk/>
NWS Shreveport - <http://www.srh.noaa.gov/shv/>
NWS Tulsa - <http://www.srh.noaa.gov/tulsa/>
NWS Jackson - <http://www.srh.noaa.gov/jan/>
NWS Memphis - <http://www.srh.noaa.gov/meg/>



National and Regional Fire Weather Links:

National Interagency Fire Center - <http://www.nifc.gov/>
Southern Area Coordination Center - <http://www.r8web.com/sacc/>
USDA Forest Service Fire Site - <http://www.fs.fed.us/fire>
National Park Service Fire Site - <http://fire.nifc.nps.gov/fire/default.htm>
U.S. Fish & Wildlife Service Fire Site - <http://fire.r9.fws.gov/>
USDA Wildland Fire Assessment System - <http://www.fs.fed.us/land/wfas/welcome.htm>
National RAWS data server - <http://www.boi.noaa.gov/FIREWX/Raws/TABLES/rawsText.htm>
RAWS Summaries - <http://raws.boi.noaa.gov/rawssum.html>

Additional Links:

Haines Index - <http://raws.boi.noaa.gov/rawssum.html>
Keetch-Byram Drought Index - <http://www.fs.fed.us/land/wfas/kbdi.gif>
Palmer Drought Index - http://nic.fb4.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif
8 to 14 day outlook - <http://www.cpc.ncep.noaa.gov/products/predictions/814day/>
30 day outlooks - <http://www.cpc.ncep.noaa.gov/products/predictions/30day/>
90 day outlooks - <http://www.cpc.ncep.noaa.gov/products/predictions/90day/lead02/>
Lightning Ignition efficiency - http://www.fs.fed.us/land/wfas/ltng_pi.gif
Weather Calculator - <http://www.srh.noaa.gov/lzk/html/metcalc.htm>
Fire Danger Class - http://www.fs.fed.us/land/wfas/fd_class.gif
Observed Relative Humidity - <http://www.fs.fed.us/land/wfas/rh.gif>
Observed Temperature - <http://www.fs.fed.us/land/wfas/temp.gif>
Observed Precipitation - <http://www.fs.fed.us/land/wfas/rain.gif>
Observed Wind Speed - <http://www.fs.fed.us/land/wfas/ws.gif>

Appendix 6: National Fire Danger Rating System Single Station Forecast Sites



Key

- | | |
|-----------------------|-----------------------|
| Point 1 - Strickler | Point 4 - Booneville |
| Point 2 - Silver Hill | Point 5 - Oden |
| Point 3 - Devils Knob | Point 6 - Jessieville |

Appendix 7: Contacts

Arkansas Oklahoma Interagency Coordination Center

110 Indiana Street
Hot Springs, Arkansas 71901
Phone: 501-321-5232 or 501-321-5231
Fax: 501-627-06330

Center Manager: Dewey Watson
Lead Dispatcher: Randy Nichols
Dispatcher: Mark Heppler

Ozark/St Francis National Forest

605 West Main
Russellville, Arkansas 72881
Phone: 479-968-2354
Fax: 479-964-7518

Forest Supervisor: Charles S Richmond
Phone: 479-964-7203
Fire Team Leader: Jim Burton
Phone: 501-321-5284
Assistant Fire Team Leader: Roger Fryar
Phone: 479-964-7262
Assistant Fire Management Officer: Johnny Lindsey
Phone: 479-964-7262
Fire Planner: Greg Vickers
Phone: 479-964-7541

Bayou Ranger District of the Ozark/St Francis National Forest

12000 SR 27
Hector, Arkansas 72843
Phone: 479-284-3150
Fax: 479-284-2015
District Ranger: Lew Purcell
Fire Management Officer: Mark Morales



Boston Mountain Ranger District of the Ozark/St Francis National Forest

Highway 23 North - POB 76

Ozark, Arkansas 72949

Phone: 479-667-2191

Fax: 479-667-5807

District Ranger: Gary Williams

Fire Management Officer: Frank Palmer

Buffalo Ranger District of the Ozark/St Francis National Forest

Highway 7 North - POB 427

Jasper, Arkansas 72641

Phone: 870-446-5122

Fax: 870-446-2063

District Ranger: Rick Metzger

Fire Management Officer: Larry Faught

Magazine Ranger District of the Ozark/St Francis National Forest

Highway 22 E and Kalamazoo Road - POB 511

Paris, Arkansas 72855

Phone: 479-963-3076

Fax: 479-963-8055

District Ranger: Rob Kopack

Fire Management Officer: Todd Hoopes

Pleasant Hill District of the Ozark/St Francis National Forest

Highway 21 North - POB 190

Clarksville, AR 72830

Phone: 479-754-2864

Fax: 479-754-2864

District Ranger: Leonard Bollman

Fire Management Officer: Jack Edwards

St. Francis Ranger District of the Ozark/St Francis National Forest

2675 Highway 44

Marianna, Arkansas 72360

Phone: 870-295-5278

Fax: 870-295-3382

District Ranger: Joseph Bonnette

Fire Management Officer: Ronnie Anderson

Sylamore Ranger District of the Ozark/St Francis National Forest

Highway 14 North - Henderson Building - POB 1279

Mountain View, AR 72560

Phone: 870-269-3228

Fax: 870-269-3000

District Ranger: Joseph Dabney

Fire Management Officer: Ronnie Anderson

Ouachita National Forest

POB Box 1270 - Federal Building

Hot Springs, Arkansas 71902

Phone: 501-321-5202

Fax: 501-321-5353

Forest Supervisor: Alan Newman

Phone: 501-321-5275

Fire Team Leader: Jim Burton

Phone: 501-321-5284

Fire Management Officer: Randy Miller

Phone: 501-321-5217

Assistant Fire Manager Officer: Dewey Watson

Phone: 501-321-5232

Caddo Ranger District of the Ouachita National Forest

912 Smokey Bear Lane

Glenwood, Arkansas 71943

Phone: 870-356-4186

Fax: 870-356-4188

District Ranger: James Watson

Fire Management Officer: James Fryar

Cold Springs Ranger District of the Ouachita National Forest

2190 E. Main Street - POB 417

Booneville, Arkansas 72927

Phone: 479-675-3233

Fax: 479-675-3232

District Ranger: Doug Webb

Fire Management Officer: Vacant

Fourche District of the Ouachita National Forest

Highway 10 East - POB 459

Danville, Arkansas 72833

Phone: 479-495-2844

Fax: 479-495-7231

District Ranger: Eugene Hayes

Fire Management Officer: Kurt Radcliffe

Jessieville Ranger District of the Ouachita National Forest

POB 189

Jessieville, Arkansas 71949

Phone: 501-984-5313

Fax: 501-984-6253

District Ranger: Steve Cannell

Fire Management Officer: Andy Dyer

Mena Ranger District of the Ouachita National Forest

1063 Highway 71 North

Mena, Arkansas 71953

Phone: 479-394-2382

Fax: 479-394-2389

District Ranger: Robert Mitchell

Fire Management Officer: Danny Baber

Oden Ranger District of the Ouachita National Forest

POB 332

Oden, Arkansas 71961

Phone: 870-326-4322

Fax: 870-326-4282

District Ranger: Robert Mitchell

Fire Management Officer: David James

Poteau Ranger District of the Ouachita National Forest

POB 2255

Waldron, Arkansas 72958

Phone: 479-637-4174

Fax: 479-637-3447

District Ranger: Doug Webb

Fire Management Officer: Vacant

Womble Ranger District of the Ouachita National Forest

POB 225 - 1523 Highway 270 East

Mt. Ida, Arkansas 71957

Phone: 870-867-2101

Fax: 870-867-3338

District Ranger: Robert Raines

Fire Management Officer: Ben Rowland

Winona District of the Ouachita National Forest

1069 N. Fourche Ave

Perryville, Arkansas 72126

Phone: 501-889-5176

Fax: 501-889-5178

District Ranger: Steve Cannell

Fire Management Officer: Andy Dyer

Buffalo National River

POB 1173

Harrison, Arkansas 72602

Phone: 870-741-5443

Fire Management Officer: J.P. Mattingly

Lower Buffalo District

Yellville, Arkansas 72687

Phone: 870-449-4311

District Ranger: Bill Vancourt

Middle Buffalo District

St. Joe, Arkansas 72675

Phone: 870-439-2502

District Ranger: Ron Parish

Lower Buffalo District

Marble Falls, Arkansas 72648

Phone: 870-446-5373

District Ranger: Chris Locker

National Wildlife Refuges

Big Lake National Wildlife Refuge

P.O. Box 67
Manila, Arkansas 72442
Phone: 870-564-2429
Contact Point: Clarke Dirks

Cache River/Bald Knob National Wildlife Refuge

Rt. 2, Box 126-T
Augusta, Arkansas 72006
Phone: 501-347-2614
Project Leader: Dennis Widner
Forester: Eric Johnson

Felsenthal/Pond Creek/Overflow National Wildlife Refuge

P.O. Box 1157
Crossett, Arkansas 71635
Phone: 870-364-3167
Refuge Manager: Jim Johnson
Forester: Larry Threet

Holla Bend National Wildlife Refuge

Rt. 1, Box 59
Dardanelle, Arkansas 72834
Phone: 479-229-4300
Refuge Manager: Bruce Bilhoude
Forester: Roger Standridge

Wapanocca National Wildlife Refuge

P.O. Box 279
Turrell, Arkansas 72384
Phone: 870-343-2595,
Refuge Manager: Glen Miller

White River National Wildlife Refuge

P.O. Box 308
DeWitt, Arkansas 72042
Phone: 870-946-1468
Refuge Manager: Larry Mallard
Forester: Jeff Denman

National Park Service

Hot Springs National Park

POB 1860

Hot Springs, Arkansas 72902

Phone: 501-624-3124

Fax: 501-623-7310

Superintendent: Beverly Harris

Fort Smith National Historic Site

POB 1406

Fort Smith, Arkansas 72902

Phone: 479-783-3961

Superintendent: Bill Black

Arkansas Post National Monument

1741 Old Post Road

Phone: 870-548-2207

Gillett, Arkansas 72055

Superintendent: Edward E Woods Jr.

Fire Ranger: Kevin Eads

Pea Ridge National Military Park

Pea Ridge, Arkansas 72751

Phone: 479-451-8122

Superintendent: Vacant

Fire Ranger: Robert Still

Arkansas Forestry Commission

Main Office

3821 West Roosevelt Rd

Little Rock, Arkansas 72204

Phone: 501-296-1864

Fax: 501-296-1946

State Forester: John Shannon

Phone: 501-296-1940

Deputy Forester: Larry Nance

Phone: 501-296-1942

State Fire Chief: Don McBride

Phone: 501-296-1870

Fire Weather Office

Sulphur Spring Dispatch Center

198 Airport Rd

Malvern, Arkansas 72014

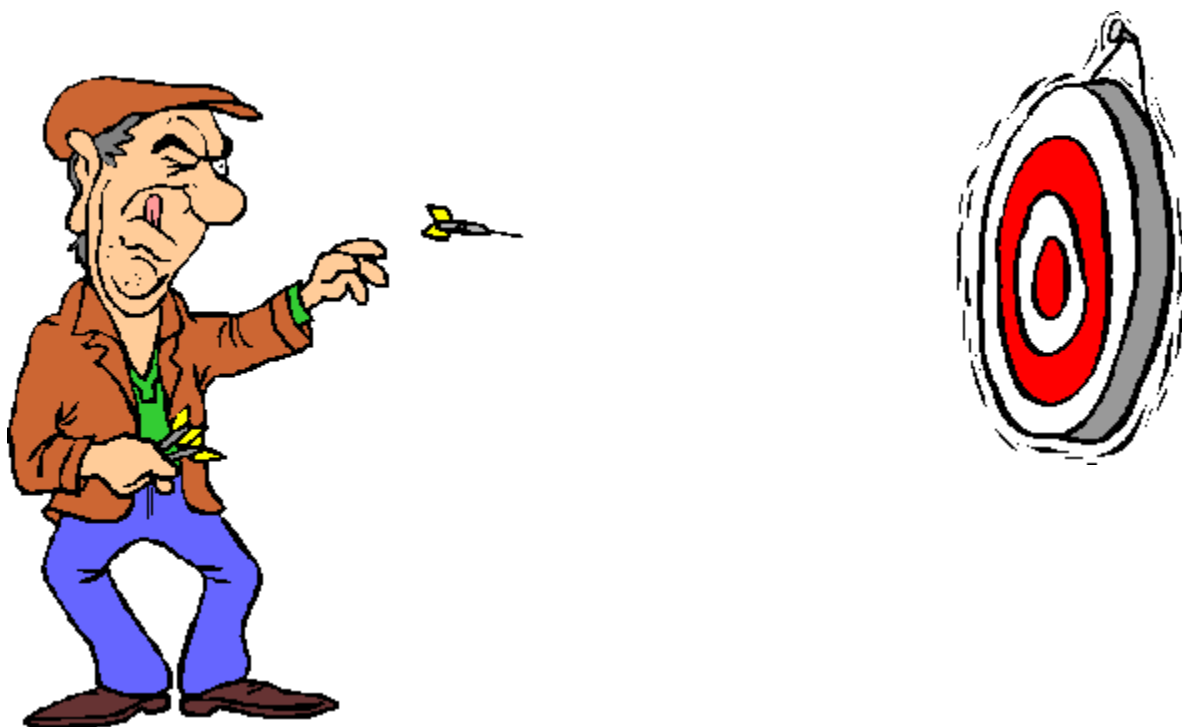
Phone: 501-332-2000

Fax: 501-332-4447

Fire Weather Forecaster: Lawrence Holm

Phone: 501-332-8194

Appendix 8: Examples of Fire Weather Forecast Products



There are several fire weather products available on-line (text and graphical). For a look, visit the National Weather Service at Little Rock Fire Weather page on the internet at:

<http://www.srh.noaa.gov/lzk/html/forest2.htm>